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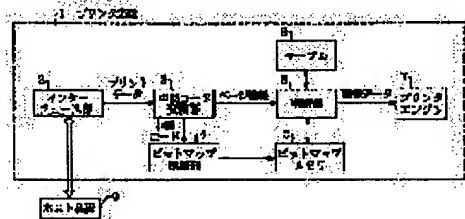
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(54) PRINTER APPARATUS

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a printer apparatus which can quickly simultaneously process and print a plurality of pages of print data sent from a host apparatus, and moreover detect whether or not the plurality of pages printed simultaneously are proper, thereby preventing the printing process from being stagnant.

SOLUTION: When a judgment part 6 confirms that an intermediate code conversion for a next page is completed from page information from an intermediate code conversion part 3, the part 6 waits for a bit map development part 4 to develop a bit pattern of the next page onto a bit map memory 5, and then continuously prints a plurality of pages including the next page. If the part 6 confirms that the intermediate code conversion for the next page is not completed, since it probably takes time to develop the bit pattern of the next page, thereby delaying a printing process by a printer engine 7 in the meantime, pages already stores in the bit map memory 5 are printed independently.



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CLAIMS

[Claim(s)]

[Claim 1] It has a pseudo code transducer, the bit map expansion section, bit map memory, and the decision section. Each page information which shows whether the conversion to a pseudo code ended the pseudo code transducer while it converted the print data for every page sent continuously from host equipment with two or more pseudo codes and sent them out to the bit map expansion section is sent out to the decision section. The bit map expansion section develops a bit pattern on bit map memory according to the sent pseudo code. Bit map memory stores the developed bit pattern, and it checks whether conversion of the pseudo code of degree page has ended the decision section by the sent page information. Image data is created according to the bit pattern of the page already stored in bit map memory when conversion was not completed. It is printer equipment characterized by creating image data according to the bit pattern containing degree page stored in bit map memory when conversion was completed, and sending out to printer engine.

[Claim 2] The above-mentioned pseudo code transducer sends out each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section while converting the print data for every page sent continuously from host equipment with two or more pseudo codes and sending out to the bit map expansion section to the decision section. It checks whether the decision section has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the bit pattern of degree page by the sent page information. Image data is created according to the bit pattern of the page already stored in bit map memory when larger than a threshold. It is printer equipment according to claim 1 which creates image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and is sent out to printer engine.

[Claim 3] It has the table which stores the threshold beforehand set as the above-mentioned printer equipment for every paper size. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the paper size of the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and each page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the corresponding paper size which was beforehand stored in the table. Image data is created according to the bit pattern of the page already stored in bit map memory when larger than a threshold. It is printer equipment according to claim 2 which creates image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and is sent out to printer engine.

[Claim 4] The above-mentioned table stores the threshold which is beforehand used on a page and which was set up for every color number. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and the color number used on a page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the corresponding color number which

was beforehand stored in the table. Image data is created according to the bit pattern already stored in bit map memory when larger than a threshold. It is printer equipment according to claim 3 which creates image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and is sent out to printer engine.

[Claim 5] The above-mentioned table stores the weight value T defined for every information classification which contains the text and graphics of a pseudo code beforehand. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the information classification of the pseudo code which is not developed by the bit pattern by the bit map expansion section is sent out to the decision section. It computes the total weight value W by the decision section choosing the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page by the sent page information from a table, respectively, and adding it. It checks whether the computed total weight value W is larger than the threshold defined beforehand. Image data is created according to the bit pattern already stored in bit map memory when larger than a threshold. It is printer equipment according to claim 4 which creates image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and is sent out to printer engine.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention aims at compaction of the processing time when printing continuously the printer equipment which forms an image in a record form according to the print data sent from host equipment etc., especially two or more pages.

[0002]

[Description of the Prior Art] With printer equipment, in order to enable it to treat the print data which are the language of the host equipment proper continuously sent from host equipment with printer equipment, beforehand, the pseudo code which is the language of imagination printer equipment was defined, and the sent print data are converted with the pseudo code. And image data is created according to the bit pattern of the 1-page unit which was made to develop and store the bit pattern of the 1-page unit corresponding to the dot of the image printed by turning the bit of bit map memory on and off according to the pseudo code for every changed 1-page unit, and was stored, and the image is printed in the record form per 1 page by sending out to printer engine.

[0003]

[Problem(s) to be Solved by the Invention] Since PURINTODE-TA sent from host equipment as mentioned above was printed per 1 page and it was printing 1 page at a time even when PURINTODE-TA of A4 size is sent to the printer equipment which can print PURINTODE-TA of A3 size, for example, printing effectiveness when two or more PURINTODE-TA of A4 size is sent continuously was bad, and all printing processings took much time amount to it.

[0004] While this invention is made in order to cancel this demerit, and printing to coincidence the print data sent from host equipment by two or more pages and making printing processing quick, it aims at obtaining the printer equipment which can prevent judging the propriety of coincidence printing for two or more pages, and printing processing stagnating.

[0005]

[Means for Solving the Problem] The printer equipment concerning this invention has a pseudo code transducer, the bit map expansion section, bit map memory, and the decision section. Each page information which shows whether the conversion to a pseudo code ended the pseudo code transducer while it converted the print data for every page sent continuously from host equipment with two or more pseudo codes and sent them out to the bit map expansion section is sent out to the decision section. The bit map expansion section develops a bit pattern on bit map memory according to the sent pseudo code. Bit map memory stores the developed bit pattern, and it checks whether conversion of the pseudo code of degree page has ended the decision section by the sent page information. Image data is created according to the bit pattern of the page already stored in bit map memory when conversion was not completed. When conversion is completed, it is characterized by creating image data according to the bit pattern containing degree page stored in bit map memory, and sending out to printer engine.

[0006] moreover The above-mentioned pseudo code transducer sends out each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section while converting the print data for every page sent continuously from host equipment with two or more pseudo codes and sending out to the bit map expansion section to

the decision section. It checks whether the decision section has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the bit pattern of degree page by the sent page information. It is good to create image data according to the bit pattern of the page already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0007] Moreover, it has the table which stores the threshold beforehand set as the above-mentioned printer equipment for every paper size. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the paper size of the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and each page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the corresponding paper size which was beforehand stored in the table. It is good to create image data according to the bit pattern of the page already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0008] Moreover, the above-mentioned table stores the threshold which is beforehand used on a page and which was set up for every color number. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and the color number used on a page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the corresponding color number which was beforehand stored in the table. It is good to create image data according to the bit pattern already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0009] Furthermore, the above-mentioned table stores the weight value T defined for every information classification which contains the text and graphics of a pseudo code beforehand. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the information classification of the pseudo code which is not developed by the bit pattern by the bit map expansion section is sent out to the decision section. It computes the total weight value W by the decision section choosing the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page by the sent page information from a table, respectively, and adding it. It checks whether the computed total weight value W is larger than the threshold defined beforehand. It is desirable to create image data according to the bit pattern already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0010]

[Embodiment of the Invention] The printer equipment of this invention forms an image in a record form according to the print data sent from host equipment etc., and in order to shorten all the processing times when printing two or more pages continuously, it has the printer engine which prints an image in a pseudo code transducer, the bit map expansion section, bit map memory, the decision section, and a record form. A pseudo code transducer sends out each page information which shows whether pseudo code conversion was completed per page to the decision section while it converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section. The bit map expansion section follows the pseudo code to which the bit on bit map memory was sent, and the bit pattern of a page unit is developed in turning on and turning off. Bit map memory stores the bit pattern of

the page unit developed by the bit map expansion section.

[0011] 1 page and 2 pages are made to print continuously by the bit map expansion section waiting to develop a 2-page bit pattern on bit map memory, and, as for the decision section, creating image data according to the bit pattern (1 page and 2 pages) stored in bit map memory, when it is checked by the page information sent from the pseudo code transducer that 2-page pseudo code conversion had been completed [which is degree page], for example, and sending out to printer engine. Moreover, when it is checked by the page information sent from the pseudo code transducer that 2-page pseudo code conversion is not completed [which is degree page], for example Since the expansion time amount of a 2-page bit pattern may become long in the bit map expansion section and the printing processing by printer engine may stagnate in the meantime, Image data is created, for example according to a 1-page bit pattern, and 1 page is made to print independently by the thing which already stored in bit map memory and to send out to printer engine.

[0012] Thus, it waits for the bit pattern of degree page to be developed by bit map memory when pseudo code conversion of degree page is completed. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at.

[0013] Moreover, although it judges whether printing processing of the page already developed by the bit pattern is independently carried out by checking whether conversion of the pseudo code of degree page has been completed above, you may make it judge whether the number of pseudo codes which is not further developed by the bit pattern of degree page is checked, and printing processing of the page is carried out independently. In this case, a pseudo code transducer sends out the page information which shows whether two or more changed pseudo codes were sent out to the bit map expansion section, and also conversion of the pseudo code of each page was completed, and the page information which shows the number of pseudo codes in which bit pattern expansion is not carried out by the bit map expansion section to the decision section.

[0014] It checks whether the decision section has the number of pseudo codes of 2 pages larger than the threshold defined beforehand bit pattern expansion is not carried out [the number] by the page information further sent by the sent page information when [which was degree page] conversion termination of a 2-page pseudo code was checked, for example. And the effectiveness of printing processing is raised by waiting for a 2-page bit pattern to be developed by bit map memory, when smaller than a threshold, for example, making 1 page and 2 pages print continuously. Moreover, since the expansion time amount over the 2 pages [by the bit map expansion section] pseudo code which is not yet developed by the bit pattern may become long and the printing processing by printer engine may stagnate in the meantime when larger than a threshold, stagnation of the printing processing by printer engine is prevented by the thing which already stored in bit map memory and which is made to print 1 page independently for example.

[0015] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently To the above-mentioned printer equipment, the page information which has the table which stored the threshold set up for every size of record forms to be used, such as A3 or A4, and shows the paper size of a page to a pseudo code transducer by for example, the thing made to send out to the decision section It checks whether the decision section is larger than the threshold as which the corresponding threshold which was set up for every size of the record form used on a page by the sent page information was chosen as from the table, and the sent number of pseudo codes chose it. That is, in order that the time amount which carries out bit pattern expansion of the pseudo code in the bit map expansion section for every paper size may carry out adjustable, it checks whether the time amount which expansion processing of the bit pattern of degree page takes using the threshold set up for every paper size is long. It can judge exactly whether printing processing of the page which the paper size of a page did not cost but was already developed by the bit pattern by this is carried out independently.

[0016] Moreover, although it judges whether printing processing of the page already developed by

the bit pattern is independently carried out by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold set up for every size of a record form Each page information which shows the color number which is made to store the threshold which is beforehand used for a table on a page, and which was set up, for example for every color numbers, such as cyanogen or cyanogen, and yellow, and is used for a pseudo code transducer on a page by making it send out to the decision section It checks whether the decision section has the long time amount which expansion processing of the bit pattern of degree page takes using the threshold which is used for printing, and which was set up for every color number. It judges exactly whether printing processing of the page which the color number used on a page did not cost by this, but was already developed by the bit pattern is carried out independently.

[0017] Although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold which is used on a page, and which was defined for every color number is carried out independently A pseudo code beforehand on a table For example, the text which consists of a character string or a straight line, The page information which shows the information classification of the pseudo code which is made to store the weight value T set up for every information classification, such as graphics which consist of a curve etc., and is not developed by the bit pattern by the pseudo code transducer by making it send out to the decision section The decision section computes the total weight value W by choosing the corresponding weight value T from a table, respectively, and adding it according to the page information which shows the information classification of the pseudo code which is not developed by the bit pattern of degree page. And it checks whether the time amount which expansion processing of the bit pattern of degree page takes by comparing with the threshold which defined the computed total weight value W beforehand is long. It judges exactly whether printing processing of the page which the image printed by the page did not cost by this, but was already developed by the bit pattern is carried out independently.

[0018]

[Example] Drawing 1 is the block diagram showing the configuration of one example of this invention. As shown in drawing, printer equipment 1 for example, in order to shorten all the processing times when forming an image in a record form according to the print data sent from the host equipment 9 grade, and printing two or more pages continuously It has the printer engine 7 which prints the interface section 2 which receives the print data for every page which connected with host equipment 9 and were sent continuously, the pseudo code transducer 3 and the bit map expansion section 4, the bit map memory 5, the decision section 6, and an image in a record form.

[0019] The pseudo code transducer 3 converts the print data for every page which received in the interface section 2 with two or more pseudo codes, and sends them out to the bit map expansion section 4. Moreover, as shown in the schematic diagram showing an example of the page information of drawing 2, the page information 31 which shows whether pseudo code conversion in each page Pn unit was completed is sent out to the decision section 6. The bit map expansion section 4 makes the bit pattern of a page unit develop and store in following the pseudo code sent from the pseudo code transducer 3, and turning on and turning off the bit on the bit map memory 5.

[0020] It uses as a capacity field for A3 size by having the capacity fields 51 and 52 of the nxm bit for A4 size, when the number of bits of n and width is set to m for the vertical number of bits, and doubling two capacity fields 51 and 52, when the printer equipment 1 of this invention treats the record form of A3 size and A4 size as the bit map memory 5 is shown in the schematic diagram showing an example of the bit map memory of drawing 3 for example. And the bit pattern which stored the bit pattern developed by the bit map expansion section 4 to the capacity fields 51 and 52 when the page to print was A3 size, for example, was developed by the capacity field 51 when it was the 1st page of A4 size is stored, and if it is the 2nd page which is degree page of A4 size, the bit pattern developed by the capacity field 52 is stored.

[0021] When it checks whether pseudo code conversion of degree page had ended the decision section 6 by the page information 31 sent from the pseudo code transducer 3 and pseudo code conversion of degree page is completed That the bit map expansion section 4 develops the bit

pattern of degree page to the capacity field 52 of the bit map memory 5. Waiting, The image data which is analog data is created according to the bit pattern containing degree page stored in the capacity fields 51 and 52 of bit map memory, and two or more pages containing degree page are made to print continuously by sending out to printer engine 7. moreover, when pseudo code conversion of degree page is not completed The time amount which develops the bit pattern of degree page in the bit map expansion section 4 becomes long. for example, it is in the middle of print data reception of degree page to which the interface section 2 was sent from host equipment 9 — etc. — Since the printing processing by printer engine may stagnate in the meantime, image data is created according to the bit pattern of the page already stored in the capacity field 51 of the bit map memory 5, and a page is made to print independently by sending out to printer engine 7.

[0022] In the facsimile apparatus constituted as mentioned above, the actuation when forming an image in a record form according to the print data covering two or more pages sent from host equipment 9 is explained with reference to the flow chart of drawing 4.

[0023] The pseudo code transducer 3 sends out the page information 31 which shows whether conversion to a pseudo code was completed to the decision section 6 while it converts the print data for every page which received in the interface section 2 with two or more pseudo codes and sends them out to the bit map expansion section 4 (step S1). The decision section 6 checks [which is degree page] whether conversion of a 2-page pseudo code has been completed, for example by the page information sent from the pseudo code transducer 3. And it stands by until it stores the 2-page bit pattern with which (step S2) and the bit map memory 5 were developed by the bit map expansion section 4, when 2-page pseudo code conversion is completed (step S3), and image data is created according to the bit pattern containing 2 pages stored in the bit map memory 5, and 1 page and 2 pages are made to print continuously by sending out to printer engine 7 (step S4). Moreover, when [which is degree page] 2-page pseudo code conversion is not completed, for example, image data is created according to (step S2) and the 1-page bit pattern already stored in the bit map memory 5, and 1 page is made to print independently by sending out to printer engine 7 (step S5). And deed actuation is ended to the print data of all pages with which these printing processings have been sent from host equipment 9 (steps S1-S6).

[0024] Thus, it waits for the bit pattern of degree page to be developed by the bit map memory 5 when pseudo code conversion of degree page is completed. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at.

[0025] Although it judges whether printing processing of the page already developed by the bit pattern is independently carried out by checking whether conversion of the pseudo code of degree page has been completed above, you may make it judge whether the number of pseudo codes which is not further developed by the bit pattern of degree page is checked, and printing processing of the page is carried out independently.

[0026] In this case, the pseudo code transducer 3 sends out the page information 31 which shows whether conversion of the pseudo code of each page was completed as two or more changed pseudo codes were sent out to the bit map expansion section 4 and also it was shown in drawing 2, and the page information 32 which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section 4 to the decision section 6. This number of pseudo codes uses the byte count of the pseudo code which is not developed by the bit pattern, or the number of pairs of a code that what is necessary is just what shows the amount of data of a pseudo code. It checks whether the decision section 6 has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the bit pattern of degree page by the page information 32 sent further, when conversion termination of the pseudo code of degree page is checked by the page information 31 sent from the pseudo code transducer 3. And the effectiveness of printing processing is raised by waiting for the bit pattern of degree page to be developed by the bit map memory 5, when smaller than a threshold, and making printer engine 7 print two or more pages containing degree page continuously. Moreover, since the expansion time amount over the pseudo code of degree page by the bit map expansion section 4 which is not yet

developed by the bit pattern may become long and the printing processing by printer engine 7 may stagnate in the meantime when larger than a threshold, stagnation of the printing processing by printer engine 7 is prevented by making the page already stored in the bit map memory 5 print independently.

[0027] in the printer equipment 1 constituted as mentioned above, when forming an image in a record form according to the print data covering two or more pages sent from host equipment 9 as show in the flow chart of the 2nd example of drawing 5 for example, the pseudo code transducer 3 send out the changed pseudo code to the bit map expansion section 4, and also send out each page information 31 and 32 to the decision section 6 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the 2-page bit pattern by (step S11) and the page information 32 sent further with the page information 31 sent from the pseudo code transducer 3 when [which is degree page] conversion termination of a 2-page pseudo code is checked, for example (step S12). And when the number of pseudo codes which is not developed by the bit pattern is smaller than a threshold, it waits for a 2-page bit pattern to be developed by the bit map memory 5 (step S13), for example, 1 page and 2 pages are made to print continuously (step S14). Moreover, when the number of pseudo codes which is not developed by the bit pattern is larger than a threshold, 1 page already stored in the bit map memory 5 is made to print independently (step S15).

[0028] Thus, it checks whether when conversion termination of the pseudo code of degree page is checked, the number of pseudo codes which is not further developed by the bit pattern of degree page is larger than the threshold defined beforehand. It waits for the bit pattern of degree page to be developed by the bit map memory 5 when smaller than a threshold. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, compaction of all the printing processing times can be aimed at further.

[0029] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently In order that the processing time which develops the pseudo code performed in the bit map expansion section 4 to a bit pattern may carry out adjustable by the paper size which is a page, It can judge exactly whether printing processing of the page already developed by the bit pattern is carried out independently by using the suitable threshold defined according to the paper size.

[0030] In this case, as shown in the block diagram of drawing 1, a table 8 is formed in the above-mentioned printer equipment 1, and a table 8 stores the thresholds 81-83 set up for every size of record forms, such as A4R which is sideways [of A3 A4, or A4] as shown in the schematic diagram showing an example of the table of drawing 6 (a). And as shown in the flow chart of drawing 5, when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out the page information 31 and 32 which the changed pseudo code is sent out to the bit map expansion section 4, and also is shown in drawing 2, and the page information 33 which shows the paper size of Page Pn to the decision section 6 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the thresholds 81-83 of the corresponding paper size which was beforehand stored in the table 8 which is not developed by the 2-page bit pattern by (step S11) and the page information 32 and 33 sent further when it checks that conversion of a 2-page pseudo code had been completed [which is degree page], for example by the page information 31 sent from the pseudo code transducer 3 (step S12).

[0031] Thus, the threshold beforehand set up for every paper size of a page is stored. It checks whether it is larger than the threshold of the paper size to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the paper size of a page cannot be started but

compaction of all the printing processing times can be aimed at further.

[0032] Although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently. By using the threshold defined according to the color number used for a page, in order that the processing time which develops the pseudo code performed in the bit map expansion section 4 to a bit pattern may carry out adjustable with the color number used for a page. It can judge exactly whether printing processing of the page already developed by the bit pattern is carried out independently.

[0033] In this case, a table 8 stores the thresholds 84–86 which are beforehand used for a page and which were set up for every color number for C (cyanogen), C (cyanogen) and Y (yellow), C (cyanogen), M (MAZENDA), etc., as shown in drawing 6 (b). And as shown in drawing 5, when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out page information 31 and 32 and the page information 34 which shows the color number used on a page to the decision section 6, as the changed pseudo code is sent out to the bit map expansion section 4 and also it is shown in drawing 2 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the thresholds 84–86 of the corresponding color number which was beforehand stored in the table 8 which is not developed by the 2–page bit pattern by (step S11) and the page information 32 and 34 sent further when it checks that conversion of a 2–page pseudo code had been completed [which is degree page], for example by the page information 31 sent from the pseudo code transducer 3 (step S12).

[0034] Thus, the threshold which is beforehand used on a page and which was set up for every color number is stored. It checks whether it is larger than the threshold of the color number to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the color number used on a page cannot be started, but compaction of all the printing processing times can be aimed at further.

[0035] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold which is used on a page, and which was defined for every color number is carried out independently. It carries out adjustable by information classification, i.e., the image printed on a page, such as graphics which consist of the text or straight line which the expansion processing time of the bit pattern in the bit map expansion section 4 becomes from the character string of each pseudo code, a curve, etc.

[0036] Then, a table 8 stores the weight value T1 beforehand set up, for example for every information classification of pseudo codes, such as Line (straight line), Curve (curve), or Text(s) (character string etc.), – T3, as shown in drawing 6 (c). And as shown in drawing 5, when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out page information 31 and the page information 35 which shows the information classification of the pseudo code which is not developed by the bit pattern to the decision section 6, as the changed pseudo code is sent out to the bit map expansion section 4 and also it is shown in drawing 2 (step S10). The decision section 6 computes the total weight value W by choosing the corresponding weight value T1 which was stored in the table 8 according to (step S11) and the page information 35 which shows the information classification of the pseudo code which is not developed by the 2–page bit pattern sent further when [which was degree page] conversion termination of a 2–page pseudo code was checked, for example – T3, respectively, and adding them by the sent page information 31. And it checks whether the computed total weight value W is larger than the threshold defined beforehand (step S12). That is, it checks whether the time amount which expansion processing of the bit pattern of degree page takes by comparing with the threshold which computed the total weight value W which is the processing time which develops the pseudo code of a degree page to a bit pattern, and was beforehand defined by

choosing and adding the weight value T1 which corresponds for every information classification of a pseudo code – T3 is long.

[0037] Thus, the total weight value W is computed by adding the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page. It checks whether the computed total weight value W is larger than the threshold defined beforehand. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold.

Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the image printed to a page cannot be started but compaction of all the printing processing times can be aimed at certainly.

[0038]

[Effect of the Invention] It waits for the bit pattern of degree page to be developed by bit map memory when pseudo code conversion of degree page is completed, as this invention was explained above. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at.

[0039] Moreover, it checks whether when conversion termination of the pseudo code of degree page is checked, the number of pseudo codes which is not further developed by the bit pattern of degree page is larger than the threshold defined beforehand. It waits for the bit pattern of degree page to be developed by bit map memory when smaller than a threshold. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, compaction of all the printing processing times can be aimed at further.

[0040] Moreover, store the threshold beforehand set up for every paper size of a page, and it checks whether it is larger than the threshold of the paper size to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the paper size of a page cannot be started but compaction of all the printing processing times can be aimed at further.

[0041] Moreover, the threshold which is beforehand used on a page and which was set up for every color number is stored. It checks whether it is larger than the threshold of the color number to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the color number used on a page cannot be started, but compaction of all the printing processing times can be aimed at further.

[0042] Furthermore, the total weight value W is computed by adding the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page. It checks whether the computed total weight value W is larger than the threshold defined beforehand. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the image printed to a page cannot be started but compaction of all the printing processing times can be aimed at certainly.

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TECHNICAL FIELD

[Field of the Invention] This invention aims at compaction of the processing time when printing continuously the printer equipment which forms an image in a record form according to the print data sent from host equipment etc., especially two or more pages.

[Translation done.]

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PRIOR ART

[Description of the Prior Art] With printer equipment, in order to enable it to treat the print data which are the language of the host equipment proper continuously sent from host equipment with printer equipment, beforehand, the pseudo code which is the language of imagination printer equipment was defined, and the sent print data are converted with the pseudo code. And image data is created according to the bit pattern of the 1-page unit which was made to develop and store the bit pattern of the 1-page unit corresponding to the dot of the image printed by turning the bit of bit map memory on and off according to the pseudo code for every changed 1-page unit, and was stored, and the image is printed in the record form per 1 page by sending out to printer engine.

[0003]

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EFFECT OF THE INVENTION

[Effect of the Invention] It waits for the bit pattern of degree page to be developed by bit map memory when pseudo code conversion of degree page is completed, as this invention was explained above. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at.

[0039] Moreover, it checks whether when conversion termination of the pseudo code of degree page is checked, the number of pseudo codes which is not further developed by the bit pattern of degree page is larger than the threshold defined beforehand. It waits for the bit pattern of degree page to be developed by bit map memory when smaller than a threshold. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, compaction of all the printing processing times can be aimed at further.

[0040] Moreover, store the threshold beforehand set up for every paper size of a page, and it checks whether it is larger than the threshold of the paper size to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the paper size of a page cannot be started but compaction of all the printing processing times can be aimed at further.

[0041] Moreover, the threshold which is beforehand used on a page and which was set up for every color number is stored. It checks whether it is larger than the threshold of the color number to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the color number used on a page cannot be started, but compaction of all the printing processing times can be aimed at further.

[0042] Furthermore, the total weight value W is computed by adding the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page. It checks whether the computed total weight value W is larger than the threshold defined beforehand. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when larger than a threshold, the image printed to a page cannot be started but compaction of all the printing processing times can be aimed at certainly.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since PURINTODE-TA sent from host equipment as mentioned above was printed per 1 page and it was printing 1 page at a time even when PURINTODE-TA of A4 size is sent to the printer equipment which can print PURINTODE-TA of A3 size, for example, printing effectiveness when two or more PURINTODE-TA of A4 size is sent continuously was bad, and all printing processings took much time amount to it.

[0004] While this invention is made in order to cancel this demerit, and printing to coincidence the print data sent from host equipment by two or more pages and making printing processing quick, it aims at obtaining the printer equipment which can prevent judging the propriety of coincidence printing for two or more pages, and printing processing stagnating.

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MEANS

[Means for Solving the Problem] The printer equipment concerning this invention has a pseudo code transducer, the bit map expansion section, bit map memory, and the decision section. Each page information which shows whether the conversion to a pseudo code ended the pseudo code transducer while it converted the print data for every page sent continuously from host equipment with two or more pseudo codes and sent them out to the bit map expansion section is sent out to the decision section. The bit map expansion section develops a bit pattern on bit map memory according to the sent pseudo code. Bit map memory stores the developed bit pattern, and it checks whether conversion of the pseudo code of degree page has ended the decision section by the sent page information. Image data is created according to the bit pattern of the page already stored in bit map memory when conversion was not completed. When conversion is completed, it is characterized by creating image data according to the bit pattern containing degree page stored in bit map memory, and sending out to printer engine.

[0006] moreover The above-mentioned pseudo code transducer sends out each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section while converting the print data for every page sent continuously from host equipment with two or more pseudo codes and sending out to the bit map expansion section to the decision section. It checks whether the decision section has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the bit pattern of degree page by the sent page information. It is good to create image data according to the bit pattern of the page already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0007] Moreover, it has the table which stores the threshold beforehand set as the above-mentioned printer equipment for every paper size. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the paper size of the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and each page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the corresponding paper size which was beforehand stored in the table. It is good to create image data according to the bit pattern of the page already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0008] Moreover, the above-mentioned table stores the threshold which is beforehand used on a page and which was set up for every color number. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section Each page information which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section and the color number used on a page is sent out to the decision section. The number of pseudo codes which is not developed by the bit pattern of degree page by the sent page information the decision section It checks whether it is larger than the threshold of the

corresponding color number which was beforehand stored in the table. It is good to create image data according to the bit pattern already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0009] Furthermore, the above-mentioned table stores the weight value T defined for every information classification which contains the text and graphics of a pseudo code beforehand. While a pseudo code transducer converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section. Each page information which shows the information classification of the pseudo code which is not developed by the bit pattern by the bit map expansion section is sent out to the decision section. It computes the total weight value W by the decision section choosing the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page by the sent page information from a table, respectively, and adding it. It checks whether the computed total weight value W is larger than the threshold defined beforehand. It is desirable to create image data according to the bit pattern already stored in bit map memory, when larger than a threshold, to create image data according to the bit pattern containing degree page stored in bit map memory when smaller than a threshold, and to send out to printer engine.

[0010]

[Embodiment of the Invention] The printer equipment of this invention forms an image in a record form according to the print data sent from host equipment etc., and in order to shorten all the processing times when printing two or more pages continuously, it has the printer engine which prints an image in a pseudo code transducer, the bit map expansion section, bit map memory, the decision section, and a record form. A pseudo code transducer sends out each page information which shows whether pseudo code conversion was completed per page to the decision section while it converts the print data for every page sent continuously from host equipment with two or more pseudo codes and sends them out to the bit map expansion section. The bit map expansion section follows the pseudo code to which the bit on bit map memory was sent, and the bit pattern of a page unit is developed in turning on and turning off. Bit map memory stores the bit pattern of the page unit developed by the bit map expansion section.

[0011] 1 page and 2 pages are made to print continuously by the bit map expansion section waiting to develop a 2-page bit pattern on bit map memory, and, as for the decision section, creating image data according to the bit pattern (1 page and 2 pages) stored in bit map memory, when it is checked by the page information sent from the pseudo code transducer that 2-page pseudo code conversion had been completed [which is degree page], for example, and sending out to printer engine. Moreover, when it is checked by the page information sent from the pseudo code transducer that 2-page pseudo code conversion is not completed [which is degree page], for example. Since the expansion time amount of a 2-page bit pattern may become long in the bit map expansion section and the printing processing by printer engine may stagnate in the meantime, image data is created, for example according to a 1-page bit pattern, and 1 page is made to print independently by the thing which already stored in bit map memory and to send out to printer engine.

[0012] Thus, it waits for the bit pattern of degree page to be developed by bit map memory when pseudo code conversion of degree page is completed. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine was prevented by printing independently the page already stored in bit map memory when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at.

[0013] Moreover, although it judges whether printing processing of the page already developed by the bit pattern is independently carried out by checking whether conversion of the pseudo code of degree page has been completed above, you may make it judge whether the number of pseudo codes which is not further developed by the bit pattern of degree page is checked, and printing processing of the page is carried out independently. In this case, a pseudo code transducer sends out the page information which shows whether two or more changed pseudo codes were sent out to the bit map expansion section, and also conversion of the pseudo code of each page was

completed, and the page information which shows the number of pseudo codes in which bit pattern expansion is not carried out by the bit map expansion section to the decision section.

[0014] It checks whether the decision section has the number of pseudo codes of 2 pages larger than the threshold defined beforehand bit pattern expansion is not carried out [the number] by the page information further sent by the sent page information when [which was degree page] conversion termination of a 2-page pseudo code was checked, for example. And the effectiveness of printing processing is raised by waiting for a 2-page bit pattern to be developed by bit map memory, when smaller than a threshold, for example, making 1 page and 2 pages print continuously. Moreover, since the expansion time amount over the 2 pages [by the bit map expansion section] pseudo code which is not yet developed by the bit pattern may become long and the printing processing by printer engine may stagnate in the meantime when larger than a threshold, stagnation of the printing processing by printer engine is prevented by the thing which already stored in bit map memory and which is made to print 1 page independently for example.

[0015] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently To the above-mentioned printer equipment, the page information which has the table which stored the threshold set up for every size of record forms to be used, such as A3 or A4, and shows the paper size of a page to a pseudo code transducer by for example, the thing made to send out to the decision section It checks whether the decision section is larger than the threshold as which the corresponding threshold which was set up for every size of the record form used on a page by the sent page information was chosen as from the table, and the sent number of pseudo codes chose it. That is, in order that the time amount which carries out bit pattern expansion of the pseudo code in the bit map expansion section for every paper size may carry out adjustable, it checks whether the time amount which expansion processing of the bit pattern of degree page takes using the threshold set up for every paper size is long. It can judge exactly whether printing processing of the page which the paper size of a page did not cost but was already developed by the bit pattern by this is carried out independently.

[0016] Moreover, although it judges whether printing processing of the page already developed by the bit pattern is independently carried out by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold set up for every size of a record form Each page information which shows the color number which is made to store the threshold which is beforehand used for a table on a page, and which was set up, for example for every color numbers, such as cyanogen or cyanogen, and yellow, and is used for a pseudo code transducer on a page by making it send out to the decision section It checks whether the decision section has the long time amount which expansion processing of the bit pattern of degree page takes using the threshold which is used for printing, and which was set up for every color number. It judges exactly whether printing processing of the page which the color number used on a page did not cost by this, but was already developed by the bit pattern is carried out independently.

[0017] Although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold which is used on a page, and which was defined for every color number is carried out independently A pseudo code beforehand on a table For example, the text which consists of a character string or a straight line, The page information which shows the information classification of the pseudo code which is made to store the weight value T set up for every information classification, such as graphics which consist of a curve etc., and is not developed by the bit pattern by the pseudo code transducer by making it send out to the decision section The decision section computes the total weight value W by choosing the corresponding weight value T from a table, respectively, and adding it according to the page information which shows the information classification of the pseudo code which is not developed by the bit pattern of degree page. And it checks whether the time amount which expansion processing of the bit pattern of degree page takes by comparing with the threshold which defined the computed total weight value W beforehand is long. It judges exactly whether printing processing of the page which the image printed by the page did not cost by this, but was already

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EXAMPLE

[Example] Drawing 1 is the block diagram showing the configuration of one example of this invention. As shown in drawing, printer equipment 1 for example, in order to shorten all the processing times when forming an image in a record form according to the print data sent from the host equipment 9 grade, and printing two or more pages continuously It has the printer engine 7 which prints the interface section 2 which receives the print data for every page which connected with host equipment 9 and were sent continuously, the pseudo code transducer 3 and the bit map expansion section 4, the bit map memory 5, the decision section 6, and an image in a record form.

[0019] The pseudo code transducer 3 converts the print data for every page which received in the interface section 2 with two or more pseudo codes, and sends them out to the bit map expansion section 4. Moreover, as shown in the schematic diagram showing an example of the page information of drawing 2, the page information 31 which shows whether pseudo code conversion in each page Pn unit was completed is sent out to the decision section 6. The bit map expansion section 4 makes the bit pattern of a page unit develop and store in following the pseudo code sent from the pseudo code transducer 3, and turning on and turning off the bit on the bit map memory 5.

[0020] It uses as a capacity field for A3 size by having the capacity fields 51 and 52 of the nxm bit for A4 size, when the number of bits of n and width is set to m for the vertical number of bits, and doubling two capacity fields 51 and 52, when the printer equipment 1 of this invention treats the record form of A3 size and A4 size as the bit map memory 5 is shown in the schematic diagram showing an example of the bit map memory of drawing 3 for example. And the bit pattern which stored the bit pattern developed by the bit map expansion section 4 to the capacity fields 51 and 52 when the page to print was A3 size, for example, was developed by the capacity field 51 when it was the 1st page of A4 size is stored, and if it is the 2nd page which is degree page of A4 size, the bit pattern developed by the capacity field 52 is stored.

[0021] When it checks whether pseudo code conversion of degree page had ended the decision section 6 by the page information 31 sent from the pseudo code transducer 3 and pseudo code conversion of degree page is completed That the bit map expansion section 4 develops the bit pattern of degree page to the capacity field 52 of the bit map memory 5 Waiting, The image data which is analog data is created according to the bit pattern containing degree page stored in the capacity fields 51 and 52 of bit map memory, and two or more pages containing degree page are made to print continuously by sending out to printer engine 7. moreover, when pseudo code conversion of degree page is not completed The time amount which develops the bit pattern of degree page in the bit map expansion section 4 becomes long. for example, it is in the middle of print data reception of degree page to which the interface section 2 was sent from host equipment 9 — etc. — Since the printing processing by printer engine may stagnate in the meantime, image data is created according to the bit pattern of the page already stored in the capacity field 51 of the bit map memory 5, and a page is made to print independently by sending out to printer engine 7.

[0022] In the facsimile apparatus constituted as mentioned above, the actuation when forming an image in a record form according to the print data covering two or more pages sent from host equipment 9 is explained with reference to the flow chart of drawing 4.

[0023] The pseudo code transducer 3 sends out the page information 31 which shows whether

conversion to a pseudo code was completed to the decision section 6 while it converts the print data for every page which received in the interface section 2 with two or more pseudo codes and sends them out to the bit map expansion section 4 (step S1). The decision section 6 checks [which is degree page] whether conversion of a 2-page pseudo code has been completed, for example by the page information sent from the pseudo code transducer 3. And it stands by until it stores the 2-page bit pattern with which (step S2) and the bit map memory 5 were developed by the bit map expansion section 4, when 2-page pseudo code conversion is completed (step S3), and image data is created according to the bit pattern containing 2 pages stored in the bit map memory 5, and 1 page and 2 pages are made to print continuously by sending out to printer engine 7 (step S4). Moreover, when [which is degree page] 2-page pseudo code conversion is not completed, for example, image data is created according to (step S2) and the 1-page bit pattern already stored in the bit map memory 5, and 1 page is made to print independently by sending out to printer engine 7 (step S5). And deed actuation is ended to the print data of all pages with which these printing processings have been sent from host equipment 9 (steps S1-S6).

[0024] Thus, it waits for the bit pattern of degree page to be developed by the bit map memory 5 when pseudo code conversion of degree page is completed. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when pseudo code conversion of degree page was not completed, compaction of all the printing processing times can be aimed at. [0025] Although it judges whether printing processing of the page already developed by the bit pattern is independently carried out by checking whether conversion of the pseudo code of degree page has been completed above, you may make it judge whether the number of pseudo codes which is not further developed by the bit pattern of degree page is checked, and printing processing of the page is carried out independently.

[0026] In this case, the pseudo code transducer 3 sends out the page information 31 which shows whether conversion of the pseudo code of each page was completed as two or more changed pseudo codes were sent out to the bit map expansion section 4 and also it was shown in drawing 2, and the page information 32 which shows the number of pseudo codes which is not developed by the bit pattern by the bit map expansion section 4 to the decision section 6. This number of pseudo codes uses the byte count of the pseudo code which is not developed by the bit pattern, or the number of pairs of a code that what is necessary is just what shows the amount of data of a pseudo code. It checks whether the decision section 6 has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the bit pattern of degree page by the page information 32 sent further, when conversion termination of the pseudo code of degree page is checked by the page information 31 sent from the pseudo code transducer 3. And the effectiveness of printing processing is raised by waiting for the bit pattern of degree page to be developed by the bit map memory 5, when smaller than a threshold, and making printer engine 7 print two or more pages containing degree page continuously. Moreover, since the expansion time amount over the pseudo code of degree page by the bit map expansion section 4 which is not yet developed by the bit pattern may become long and the printing processing by printer engine 7 may stagnate in the meantime when larger than a threshold, stagnation of the printing processing by printer engine 7 is prevented by making the page already stored in the bit map memory 5 print independently.

[0027] in the printer equipment 1 constituted as mentioned above, when forming an image in a record form according to the print data covering two or more pages sent from host equipment 9 as show in the flow chart of the 2nd example of drawing 5 for example, the pseudo code transducer 3 send out the changed pseudo code to the bit map expansion section 4, and also send out each page information 31 and 32 to the decision section 6 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the threshold defined beforehand which is not developed by the 2-page bit pattern by (step S11) and the page information 32 sent further with the page information 31 sent from the pseudo code transducer 3 when [which is degree page] conversion termination of a 2-page pseudo code is checked, for example (step S12). And when the number of pseudo codes which is not developed by the bit pattern is smaller than a threshold, it waits for a 2-page bit pattern to be developed by the bit map memory 5 (step S13),

for example, 1 page and 2 pages are made to print continuously (step S14). Moreover, when the number of pseudo codes which is not developed by the bit pattern is larger than a threshold, 1 page already stored in the bit map memory 5 is made to print independently (step S15).

[0028] Thus, it checks whether when conversion termination of the pseudo code of degree page is checked, the number of pseudo codes which is not further developed by the bit pattern of degree page is larger than the threshold defined beforehand. It waits for the bit pattern of degree page to be developed by the bit map memory 5 when smaller than a threshold. The effectiveness of printing processing is raised by printing two or more pages containing degree page continuously. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, compaction of all the printing processing times can be aimed at further.

[0029] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently In order that the processing time which develops the pseudo code performed in the bit map expansion section 4 to a bit pattern may carry out adjustable by the paper size which is a page, It can judge exactly whether printing processing of the page already developed by the bit pattern is carried out independently by using the suitable threshold defined according to the paper size.

[0030] In this case, as shown in the block diagram of drawing 1 , a table 8 is formed in the above-mentioned printer equipment 1, and a table 8 stores the thresholds 81-83 set up for every size of record forms, such as A4R which is sideways [of A3 A4, or A4] as shown in the schematic diagram showing an example of the table of drawing 6 (a). And as shown in the flow chart of drawing 5 , when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out the page information 31 and 32 which the changed pseudo code is sent out to the bit map expansion section 4, and also is shown in drawing 2 , and the page information 33 which shows the paper size of Page Pn to the decision section 6 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the thresholds 81-83 of the corresponding paper size which was beforehand stored in the table 8 which is not developed by the 2-page bit pattern by (step S11) and the page information 32 and 33 sent further when it checks that conversion of a 2-page pseudo code had been completed [which is degree page], for example by the page information 31 sent from the pseudo code transducer 3 (step S12).

[0031] Thus, the threshold beforehand set up for every paper size of a page is stored. It checks whether it is larger than the threshold of the paper size to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the paper size of a page cannot be started but compaction of all the printing processing times can be aimed at further.

[0032] Although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold defined beforehand is carried out independently By using the threshold defined according to the color number used for a page, in order that the processing time which develops the pseudo code performed in the bit map expansion section 4 to a bit pattern may carry out adjustable with the color number used for a page It can judge exactly whether printing processing of the page already developed by the bit pattern is carried out independently.

[0033] In this case, a table 8 stores the thresholds 84-86 which are beforehand used for a page and which were set up for every color number for C (cyanogen), C (cyanogen) and Y (yellow), C (cyanogen), M (MAZENDA), etc., as shown in drawing 6 (b). And as shown in drawing 5 , when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out page information 31 and 32 and the page information 34 which shows the color number used on a page to the decision section 6, as the changed pseudo

code is sent out to the bit map expansion section 4 and also it is shown in drawing 2 (step S10). It checks whether the decision section 6 has the number of pseudo codes larger than the thresholds 84-86 of the corresponding color number which was beforehand stored in the table 8 which is not developed by the 2-page bit pattern by (step S11) and the page information 32 and 34 sent further when it checks that conversion of a 2-page pseudo code had been completed [which is degree page], for example by the page information 31 sent from the pseudo code transducer 3 (step S12).

[0034] Thus, the threshold which is beforehand used on a page and which was set up for every color number is stored. It checks whether it is larger than the threshold of the color number to which the number of pseudo codes which is not developed by the bit pattern of degree page corresponds. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the color number used on a page cannot be started, but compaction of all the printing processing times can be aimed at further.

[0035] Moreover, although it judges whether printing processing of the page already developed by the bit pattern by checking whether the number of pseudo codes which is not developed by the bit pattern of degree page above is larger than the threshold which is used on a page, and which was defined for every color number is carried out independently It carries out adjustable by information classification, i.e., the image printed on a page, such as graphics which consist of the text or straight line which the expansion processing time of the bit pattern in the bit map expansion section 4 becomes from the character string of each pseudo code, a curve, etc.

[0036] Then, a table 8 stores the weight value T1 beforehand set up, for example for every information classification of pseudo codes, such as Line (straight line), Curve (curve), or Text(s) (character string etc.), - T3, as shown in drawing 6 (c). And as shown in drawing 5, when carrying out printing processing according to the print data sent from host equipment 9, the pseudo code transducer 3 sends out page information 31 and the page information 35 which shows the information classification of the pseudo code which is not developed by the bit pattern to the decision section 6, as the changed pseudo code is sent out to the bit map expansion section 4 and also it is shown in drawing 2 (step S10). The decision section 6 computes the total weight value W by choosing the corresponding weight value T1 which was stored in the table 8 according to (step S11) and the page information 35 which shows the information classification of the pseudo code which is not developed by the 2-page bit pattern sent further when [which was degree page] conversion termination of a 2-page pseudo code was checked, for example - T3, respectively, and adding them by the sent page information 31. And it checks whether the computed total weight value W is larger than the threshold defined beforehand (step S12). That is, it checks whether the time amount which expansion processing of the bit pattern of degree page takes by comparing with the threshold which computed the total weight value W which is the processing time which develops the pseudo code of a degree page to a bit pattern, and was beforehand defined by choosing and adding the weight value T1 which corresponds for every information classification of a pseudo code - T3 is long.

[0037] Thus, the total weight value W is computed by adding the weight value T which corresponds according to the information classification of the pseudo code which is not developed by the bit pattern of degree page. It checks whether the computed total weight value W is larger than the threshold defined beforehand. The effectiveness of printing processing is raised by printing continuously two or more pages which contains degree page when smaller than a threshold. Moreover, since stagnation of the printing processing by printer engine 7 was prevented by printing independently the page already stored in the bit map memory 5 when larger than a threshold, the image printed to a page cannot be started but compaction of all the printing processing times can be aimed at certainly.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of one example of this invention.

[Drawing 2] It is the schematic diagram showing an example of page information.

[Drawing 3] It is the schematic diagram showing an example of bit map memory.

[Drawing 4] It is a flow chart explaining actuation of the above-mentioned example.

[Drawing 5] It is a flow chart explaining actuation of the 2nd example.

[Drawing 6] It is the schematic diagram showing an example of a table.

[Description of Notations]

1 Printer Equipment

2 Interface Section

3 Pseudo Code Transducer

4 Bit Map Expansion Section

5 Bit Map Memory

6 Decision Section

7 Printer Engine

8 Table

[Translation done.]

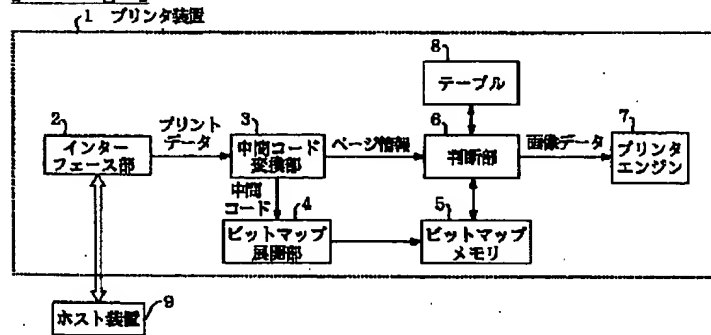
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DRAWINGS

[Drawing 1]



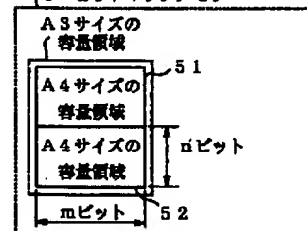
[Drawing 2]

ページ情報

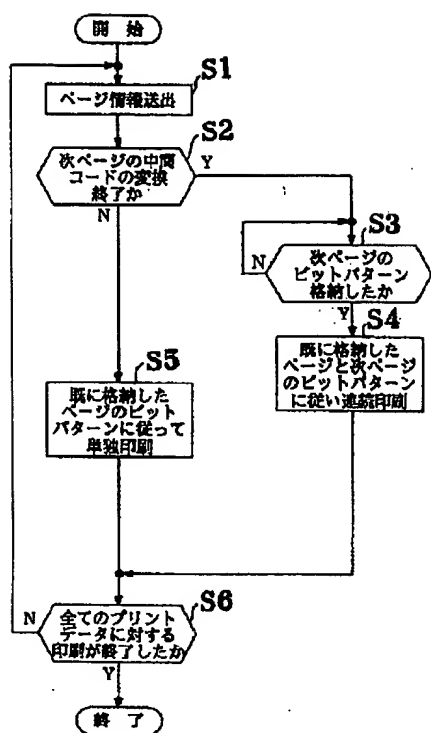
情報	内容
0	ページ番号 P _n
1	中間コード変換終了又は変換途中
2	ビットパターンに展開されていない 中間コード数
3	用紙サイズ
4	使用する色数
5	ビットパターンに展開されていない 中間コードの情報種別

[Drawing 3]

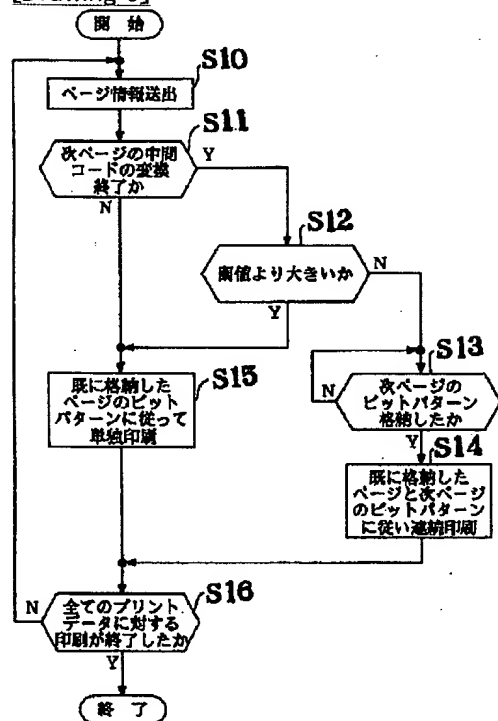
5 ビットマップメモリ



[Drawing 4]



[Drawing 5]



[Drawing 6]

(a)

8 テーブル

用紙サイズ	
A3	関値 81
A4	関値 82
A4 R	関値 83
⋮	⋮

(b)

8 テーブル

使用色数	
C	関値 84
C+Y	関値 85
C+M	関値 86
⋮	⋮

(c)

8 テーブル

中間コード 情報種別	
Line	ウェイト値T1
Curve	ウェイト値T2
Text	ウェイト値T3
⋮	⋮

[Translation done.]

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H 0 4 N	1/21	H 0 4 N	1/21

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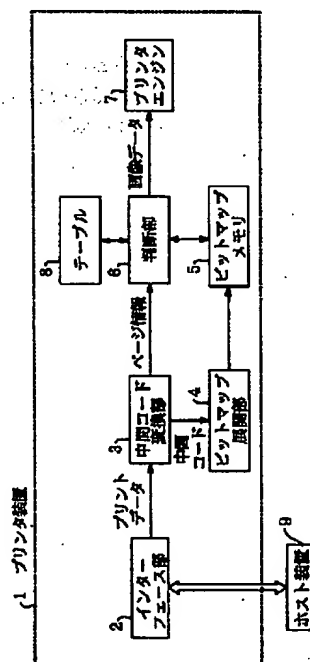
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(54)【発明の名称】 プリンタ装置

(57)【要約】

【課題】 ホスト装置から送られたプリントデータを 1 ページ単位で印刷しているからプリントデータが連続して複数送られた場合の印刷効率が悪かった。

【解決手段】 判断部 6 は中間コード変換部 3 からのページ情報によって次ページの中間コード変換が終了したのを確認した場合に、ビットマップ展開部 4 がビットマップメモリ 5 上に次ページのビットパターンを展開するのを待って、次ページを含む複数ページを連続して印刷させる。また、次ページの中間コード変換が終了していないのを確認した場合に、次ページのビットパターンを展開処理に時間がかかり、その間プリンタエンジン 7 による印刷処理が停滞する可能性があるため、既にビットマップメモリ 5 に格納したページを単独で印刷させる。



【特許請求の範囲】

【請求項1】 中間コード変換部とビットマップ展開部とビットマップメモリ及び判断部とを有し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共に中間コードへの変換が終了したか否かを示す各ページ情報を判断部に送出し、ビットマップ展開部は送られた中間コードに従ってビットマップメモリ上にビットパターンを展開し、ビットマップメモリは展開されたビットパターンを格納し、判断部は送られたページ情報によって次ページの中間コードの変換が終了したか否かを確認し、変換が終了していないときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、変換が終了したときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出することを特徴とするプリンタ装置。

【請求項2】 上記中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されていない中間コード数を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されていない中間コード数があらかじめ定めた閾値より大きいと確認し、閾値より大きいときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出する請求項1記載のプリンタ装置。

【請求項3】 上記プリンタ装置にあらかじめ各用紙サイズ毎に設定した閾値を格納するテーブルを有し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されていない中間コード数と各ページの用紙サイズを示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されていない中間コード数が、あらかじめテーブルに格納した該当する用紙サイズの閾値より大きいと確認し、閾値より大きいときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出する請求項2記載のプリンタ装置。

【請求項4】 上記テーブルはあらかじめページで使用する色数毎に設定した閾値を格納し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開

部に送出すると共にビットマップ展開部によってビットパターンに展開されていない中間コード数とページで使用する色数を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されていない中間コード数が、あらかじめテーブルに格納した該当する色数の閾値より大きいと確認し、閾値より大きいときは既にビットマップメモリに格納したビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出する請求項3記載のプリンタ装置。

【請求項5】 上記テーブルはあらかじめ中間コードのテキストとグラフィックスを含む情報種別毎に定めたウェイト値Tを格納し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されていない中間コードの情報種別を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されていない中間コードの情報種別に従って該当するウェイト値Tをテーブルからそれぞれ選択して加算して総ウェイト値Wを算出し、算出した総ウェイト値Wがあらかじめ定めた閾値より大きいと確認し、閾値より大きいときは既にビットマップメモリに格納したビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出する請求項4記載のプリンタ装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 この発明はホスト装置等から送られてきたプリントデータに従って記録用紙に画像を形成するプリンタ装置、特に複数のページを連続して印刷するときの処理時間の短縮を図るものである。

【0002】

【従来の技術】 プリンタ装置では、ホスト装置から連続して送られてくるホスト装置固有のランゲージであるプリントデータをプリンタ装置で扱えるようにするため、あらかじめ仮想的なプリンタ装置のランゲージである中間コードを定義して、送られたプリントデータを中間コードに変換している。そして、変換した1ページ単位毎の中間コードに従って例えばビットマップメモリのビットをオン・オフすることで印刷する画像のドットに対応した1ページ単位のビットパターンを展開して格納させ、格納した1ページ単位のビットパターンに従って画像データを作成し、プリンタエンジンに送出することで1ページ単位で記録用紙に画像を印刷している。

【0003】

【発明が解決しようとする課題】上記のようにホスト装置から送られたプリントデータを1ページ単位で印刷しているから、例えばA3サイズのプリントデータを印刷できるプリンタ装置にA4サイズのプリントデータが送られたときでも1ページずつ印刷しているため、A4サイズのプリントデータが連続して複数送られた場合の印刷効率が悪く、全印刷処理に多くの時間を要した。

【0004】この発明はかかる短所を解消するためになされたものであり、ホスト装置から送られたプリントデータを同時に複数ページ分印刷して印刷処理を迅速にするとともに複数ページ分の同時印刷の適否を判定して印刷処理が停滞するのを防ぐことができるプリンタ装置を得ることを目的とする。

【0005】

【課題を解決するための手段】この発明に係るプリンタ装置は、中間コード変換部とビットマップ展開部とビットマップメモリ及び判断部とを有し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共に中間コードへの変換が終了したか否かを示す各ページ情報を判断部に送出し、ビットマップ展開部は送られた中間コードに従ってビットマップメモリ上にビットパターンを展開し、ビットマップメモリは展開されたビットパターンを格納し、判断部は送られたページ情報によって次ページの中間コードの変換が終了したか否かを確認し、変換が終了していないときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、変換が終了したときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出することを特徴とする。

【0006】また、上記中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されてない中間コード数を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されてない中間コード数があらかじめ定めた閾値より大きいかなんかを確認し、閾値より大きいときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出すると良い。

【0007】また、上記プリンタ装置にあらかじめ各用紙サイズ毎に設定した閾値を格納するテーブルを有し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されてない中間コード

数と各ページの用紙サイズを示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されてない中間コード数が、あらかじめテーブルに格納した該当する用紙サイズの閾値より大きいかなんかを確認し、閾値より大きいときは既にビットマップメモリに格納したページのビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出すると良い。

【0008】また、上記テーブルはあらかじめページで使用する色数毎に設定した閾値を格納し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されてない中間コード数とページで使用する色数を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されてない中間コード数が、あらかじめテーブルに格納した該当する色数の閾値より大きいかなんかを確認し、閾値より大きいときは既にビットマップメモリに格納したビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出すると良い。

【0009】更に、上記テーブルはあらかじめ中間コードのテキストとグラフィックスを含む情報種別毎に定めたウエイト値Tを格納し、中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にビットマップ展開部によってビットパターンに展開されてない中間コードの情報種別を示す各ページ情報を判断部に送出し、判断部は送られたページ情報によって次ページのビットパターンに展開されてない中間コードの情報種別に従って該当するウエイト値Tをテーブルからそれぞれ選択して加算して総ウエイト値Wを算出し、算出した総ウエイト値Wがあらかじめ定めた閾値より大きいかなんかを確認し、閾値より大きいときは既にビットマップメモリに格納したビットパターンに従って画像データを作成し、閾値より小さいときはビットマップメモリに格納した次ページを含むビットパターンに従って画像データを作成してプリンタエンジンに送出することが望ましい。

【0010】

【発明の実施の形態】この発明のプリンタ装置は、ホスト装置等から送られてきたプリントデータに従って記録用紙に画像を形成するものであり、複数のページを連続して印刷するときの全処理時間を短縮するために、中間コード変換部とビットマップ展開部とビットマップメモリと判断部及び記録用紙に画像を印刷するプリンタエン

ジンとを有する。中間コード変換部はホスト装置から連続して送られたページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部に送出すると共にページ単位で中間コード変換が終了したか否かを示す各ページ情報を判断部に送出する。ビットマップ展開部はビットマップメモリ上のビットを送られた中間コードに従ってオン、オフすることでページ単位のビットパターンを展開する。ビットマップメモリはビットマップ展開部によって展開されたページ単位のビットパターンを格納する。

【0011】判断部は中間コード変換部から送られたページ情報によって次ページである例えば2ページの中間コード変換が終了したのを確認した場合に、ビットマップ展開部がビットマップメモリ上に2ページのビットパターンを展開するのを待って、ビットマップメモリに格納した1ページと2ページのビットパターンに従って画像データを作成しプリンタエンジンに送出することで1ページと2ページを連続して印刷させる。また、中間コード変換部から送られたページ情報によって次ページである例えば2ページの中間コード変換が終了していないのを確認した場合に、ビットマップ展開部で2ページのビットパターンの展開時間が長くなり、その間プリンタエンジンによる印刷処理が停滞する可能性があるため、既にビットマップメモリに格納した例えば1ページのビットパターンに従って画像データを作成し、プリンタエンジンに送出することで1ページを単独で印刷させる。

【0012】このように、次ページの中間コード変換が終了しているときはビットマップメモリに次ページのビットパターンが展開されるのを待って、次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、次ページの中間コード変換が終了していないときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたため、全印刷処理時間の短縮を図ることができる。

【0013】また、上記では次ページの中間コードの変換が終了したか否かを確認することで、既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、更に次ページのビットパターンに展開されてない中間コード数を確認してページを単独で印刷処理するか否かを判断するようにしても良い。この場合、中間コード変換部は変換した複数の中間コードをビットマップ展開部に送出する他に、各ページの中間コードの変換が終了したか否かを示すページ情報と、ビットマップ展開部によってビットパターン展開されてない中間コード数を示すページ情報を判断部に送出する。

【0014】判断部は送られたページ情報によって次ページである例えば2ページの中間コードの変換終了を確認したときは、更に送られたページ情報によってビットパターン展開されてない2ページの中間コード数があ

かじめ定めた閾値より大きいかなんかを確認する。そして、閾値より小さい場合にビットマップメモリに2ページのビットパターンが展開されるのを待って、例えば1ページと2ページを連続して印刷させることで印刷処理の効率を上げる。また、閾値より大きい場合にビットマップ展開部による2ページの未だビットパターンに展開されてない中間コードに対する展開時間が長くなり、その間プリンタエンジンによる印刷処理が停滞する可能性があるため、既にビットマップメモリに格納した例えば1ページを単独で印刷させることでプリンタエンジンによる印刷処理の停滞を防ぐ。

【0015】また、上記では次ページのビットパターンに展開されてない中間コード数があらかじめ定めた閾値より大きいかなんかを確認することで既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、上記プリンタ装置に例えばA3或いはA4など使用する記録用紙のサイズ毎に設定した閾値を格納したテーブルを有し、中間コード変換部にページの用紙サイズを示すページ情報を判断部に送出させることで、判断部は送られたページ情報によってページで使用する記録用紙のサイズ毎に設定した該当する閾値をテーブルから選択し、送られた中間コード数が選択した閾値より大きいかなんかを確認する。即ち、用紙サイズ毎にビットマップ展開部で中間コードをビットパターン展開する時間が可変するため、用紙サイズ毎に設定した閾値を用いて次ページのビットパターンの展開処理にかかる時間が長いかなんかを確認する。これにより、ページの用紙サイズに係らず既にビットパターンに展開されたページを単独で印刷処理するか否かを的確に判断することができる。

【0016】また、上記では次ページのビットパターンに展開されてない中間コード数が記録用紙のサイズ毎に設定した閾値より大きいかなんかを確認することで、既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、テーブルにあらかじめページで使用する例えばシアン又はシアンとイエローなどの色数毎に設定した閾値を格納させ、中間コード変換部にページで使用する色数を示す各ページ情報を判断部に送出させることで、判断部は印刷に使用する色数毎に設定した閾値を用いて次ページのビットパターンの展開処理にかかる時間が長いかなんかを確認する。これにより、ページで使用する色数に係らず既にビットパターンに展開されたページを単独で印刷処理するか否かを的確に判断する。

【0017】上記では次ページのビットパターンに展開されてない中間コード数がページで使用する色数毎に定めた閾値より大きいかなんかを確認することで既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、テーブルにあらかじめ中間コードの例えば文字列からなるテキスト又は直線、曲線等から

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なるグラフィックスなどの情報種別毎に設定したウエイト値Tを格納させ、中間コード変換部でビットパターンに展開されてない中間コードの情報種別を示すページ情報を判断部に送出させることで、判断部は次ページのビットパターンに展開されてない中間コードの情報種別を示すページ情報に従って、該当するウエイト値Tをテーブルからそれぞれ選択して加算することで総ウエイト値Wを算出する。そして、算出した総ウエイト値Wをあらかじめ定めた閾値と比較することで次ページのビットパターンの展開処理にかかる時間が長いかなんかを確認する。これにより、ページに印刷される画像に係らず既にビットパターンに展開されたページを単独で印刷処理するか否かを的確に判断する。

【0018】

【実施例】図1はこの発明の一実施例の構成を示すブロック図である。図に示すようにプリンタ装置1は例えばホスト装置9等から送られてきたプリントデータに従って記録用紙に画像を形成するものであり、複数ページを連続して印刷するときの全処理時間を短縮するために、ホスト装置9と接続し連続して送られたページ毎のプリントデータを受信するインターフェース部2と、中間コード変換部3とビットマップ展開部4とビットマップメモリ5と判断部6及び画像を記録用紙に印刷するプリンタエンジン7とを有する。

【0019】中間コード変換部3はインターフェース部2で受信したページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部4に送出する。また、図2のページ情報の一例を示す概要図に示すように、各ページP_n単位での中間コード変換が終了したか否かを示すページ情報31を判断部6に送出する。ビットマップ展開部4はビットマップメモリ5上のビットを中間コード変換部3から送られた中間コードに従ってオン、オフすることでページ単位のビットパターンを展開し格納させる。

【0020】ビットマップメモリ5は図3のビットマップメモリ5の一例を示す概要図に示すように、例えば本発明のプリンタ装置1がA3サイズとA4サイズの記録用紙を扱う場合、縦のビット数をn、横のビット数をmとしたときにA4サイズ分のn×mビットの容量領域51、52を有し、容量領域51、52を2つ合わせることでA3サイズ分の容量領域として用いる。そして、印刷するページがA3サイズであればビットマップ展開部4によって容量領域51、52に展開されたビットパターンを格納し、例えばA4サイズの1ページ目であれば容量領域51に展開されたビットパターンを格納し、A4サイズの次ページである2ページ目であれば容量領域52に展開されたビットパターンを格納する。

【0021】判断部6は中間コード変換部3から送られたページ情報31によって次ページの中間コード変換が終了したか否かを確認し、次ページの中間コード変換が

終了している場合には、ビットマップ展開部4がビットマップメモリ5の例えば容量領域52に次ページのビットパターンを展開するのを待ち、ビットマップメモリ5の容量領域51、52に格納した次ページを含むビットパターンに従って例えばアナログデータである画像データを作成し、プリンタエンジン7に送出することで次ページを含む複数のページを連続して印刷させる。また、次ページの中間コード変換が終了していない場合には、例えばインターフェース部2がホスト装置9から送られた次ページのプリントデータ受信途中である等によりビットマップ展開部4で次ページのビットパターンを展開する時間が長くなり、その間プリンタエンジンによる印刷処理が停滞する可能性があるため、既にビットマップメモリ5の例えば容量領域51に格納したページのビットパターンに従って画像データを作成し、プリンタエンジン7に送出することでページを単独で印刷させる。

【0022】上記のように構成したファクシミリ装置において、例えば、ホスト装置9から送られた複数のページに亘るプリントデータに従って画像を記録用紙に形成するときの動作を図4のフローチャートを参照して説明する。

【0023】中間コード変換部3はインターフェース部2で受信したページ毎のプリントデータを複数の中間コードに変換してビットマップ展開部4に送出すると共に中間コードへの変換が終了したか否かを示すページ情報31を判断部6に送出する(ステップS1)。判断部6は中間コード変換部3から送られたページ情報によって次ページである例えば2ページの中間コードの変換が終了したか否かを確認する。そして、2ページの中間コード変換が終了している場合には(ステップS2)、ビットマップメモリ5がビットマップ展開部4によって展開された2ページのビットパターンを格納するまで待機し(ステップS3)、ビットマップメモリ5に格納された2ページを含むビットパターンに従って画像データを作成し、プリンタエンジン7に送出することで1ページと2ページを連続して印刷させる(ステップS4)。また、次ページである例えば2ページの中間コード変換が終了していない場合には(ステップS2)、既にビットマップメモリ5に格納した1ページのビットパターンに従って画像データを作成し、プリンタエンジン7に送出することで1ページを単独で印刷させる(ステップS5)。そして、これらの印刷処理をホスト装置9から送られてきた全てのページのプリントデータに対しておこない動作を終了する(ステップS1～S6)。

【0024】このように、次ページの中間コード変換が終了しているときはビットマップメモリ5に次ページのビットパターンが展開されるのを待って、次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、次ページの中間コード変換が終了していないときは既にビットマップメモリ5に格納したページ

を単独で印刷することでプリンタエンジン7による印刷処理の停滞を防ぐようにしたため、全印刷処理時間の短縮を図ることができる。

【0025】上記では次ページの間コードの変換が終了したか否かを確認することで、既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、更に次ページのビットパターンに展開されていない中間コード数を確認してページを単独で印刷処理するか否かを判断するようにしても良い。

【0026】この場合、中間コード変換部3は変換した複数の中間コードをビットマップ展開部4に送出する他に、図2に示すように各ページの間コードの変換が終了したか否かを示すページ情報31と、ビットマップ展開部4によってビットパターンに展開されていない中間コード数を示すページ情報32を判断部6に送出する。この中間コード数は中間コードのデータ量を示すものであれば良く、例えばビットパターンに展開されていない中間コードのバイト数又はコードのペア数を使用する。判断部6は中間コード変換部3から送られたページ情報31によって次ページの間コードの変換終了を確認したときは、更に送られたページ情報32によって次ページのビットパターンに展開されていない中間コード数があらかじめ定めた閾値より大きいかなんかを確認する。そして、閾値より小さい場合にビットマップメモリ5に次ページのビットパターンが展開されるのを待って、次ページを含む複数のページを連続してプリンタエンジン7に印刷させることで印刷処理の効率を上げる。また、閾値より大きい場合にビットマップ展開部4による次ページの未だビットパターンに展開されていない中間コードに対する展開時間が長くなり、その間プリンタエンジン7による印刷処理が停滞する可能性があるため、既にビットマップメモリ5に格納したページを単独で印刷させることでプリンタエンジン7による印刷処理の停滞を防ぐ。

【0027】上記のように構成したプリンタ装置1において、図5の第2の実施例のフローチャートに示すように例えばホスト装置9から送られた複数のページに亘るプリントデータに従って画像を記録用紙に形成する場合、中間コード変換部3は変換した中間コードをビットマップ展開部4に送出する他に、各ページ情報31、32を判断部6に送出する(ステップS10)。判断部6は中間コード変換部3から送られたページ情報31によって次ページである例えば2ページの間コードの変換終了を確認したときは(ステップS11)、更に送られたページ情報32によって2ページのビットパターンに展開されていない中間コード数があらかじめ定めた閾値より大きいかなんかを確認する(ステップS12)。そして、ビットパターンに展開されていない中間コード数が閾値より小さい場合にビットマップメモリ5に2ページのビットパターンが展開されるのを待って(ステップS13)、例えば1ページと2ページを連続して印刷させる

(ステップS14)。また、ビットパターンに展開されていない中間コード数が閾値より大きい場合には既にビットマップメモリ5に格納した例えば1ページを単独で印刷させる(ステップS15)。

【0028】このように、次ページの間コードの変換終了を確認した場合、更に次ページのビットパターンに展開されていない中間コード数があらかじめ定めた閾値より大きいかなんかを確認し、閾値より小さいときはビットマップメモリ5に次ページのビットパターンが展開されるのを待って、次ページを含む複数のページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリ5に格納したページを単独で印刷することでプリンタエンジン7による印刷処理の停滞を防ぐようにしたため、全印刷処理時間の短縮を更に図ることができる。

【0029】また、上記では次ページのビットパターンに展開されていない中間コード数があらかじめ定めた閾値より大きいかなんかを確認することで既にビットパターンに展開されたページを単独で印刷処理するか否かを判断しているが、ビットマップ展開部4でおこなう中間コードをビットパターンに展開する処理時間がページの用紙サイズによって可変するため、用紙サイズに応じて定めた適切な閾値を用いることで既にビットパターンに展開されたページを単独で印刷処理するか否かを的確に判断することができる。

【0030】この場合、図1のブロック図に示すように上記プリンタ装置1にテーブル8を設け、テーブル8は例えば図6(a)のテーブルの一例を示す概要図に示すようにA3或いはA4又はA4の横向きであるA4Rなど記録用紙のサイズ毎に設定した閾値81~83を格納する。そして、図5のフローチャートに示すようにホスト装置9から送られたプリントデータに従って印刷処理をする場合、中間コード変換部3は変換した中間コードをビットマップ展開部4に送出する他に、図2に示すページ情報31、32と、ページPnの用紙サイズを示すページ情報33を判断部6に送出する(ステップS10)。判断部6は中間コード変換部3から送られたページ情報31によって次ページである例えば2ページの間コードの変換が終了したのを確認したときは(ステップS11)、更に送られたページ情報32、33によって2ページのビットパターンに展開されていない中間コード数があらかじめテーブル8に格納した該当する用紙サイズの閾値81~83より大きいかなんかを確認する(ステップS12)。

【0031】このように、あらかじめページの用紙サイズ毎に設定した閾値を格納し、次ページのビットパターンに展開されていない中間コード数が該当する用紙サイズの閾値より大きいかなんかを確認し、閾値より小さいときは次ページを含む複数のページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既

にビットマップメモリ5に格納したページを単独で印刷することでプリンタエンジン7による印刷処理の停滞を防ぐようにしたため、ページの用紙サイズに係らず全印刷処理時間の短縮を更に図ることができる。

【0032】上記では次ページのビットパターンに展開されてない中間コード数があらかじめ定めた閾値より大きいかなんかを判断することで既にビットパターンに展開されたページを単独で印刷処理するかなんかを判断しているが、ビットマップ展開部4でおこなう中間コードをビットパターンに展開する処理時間がページに使用する色数によって可変するため、ページに使用する色数に応じて定めた閾値を用いることで、既にビットパターンに展開されたページを単独で印刷処理するかなんかを的確に判断することができる。

【0033】この場合、テーブル8は例えば図6(b)に示すように例えばC(シアン)或いはC(シアン)とY(イエロー)又はC(シアン)とM(マゼンダ)等、あらかじめページに使用する色数毎に設定した閾値84~86を格納する。そして、図5に示すようにホスト装置9から送られたプリントデータに従って印刷処理をする場合に中間コード変換部3は変換した中間コードをビットマップ展開部4に送出する他に、図2に示すようにページ情報31、32と、ページで使用する色数を示すページ情報34を判断部6に送出する(ステップS10)。判断部6は中間コード変換部3から送られたページ情報31によって次ページである例えば2ページの中間コードの変換が終了したのを確認したときは(ステップS11)、更に送られたページ情報32、34によって2ページのビットパターンに展開されてない中間コード数があらかじめテーブル8に格納した該当する色数の閾値84~86より大きいかなんかを判断する(ステップS12)。

【0034】このように、あらかじめページで使用する色数毎に設定した閾値を格納し、次ページのビットパターンに展開されてない中間コード数が該当する色数の閾値より大きいかなんかを判断し、閾値より小さいときは次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリ5に格納したページを単独で印刷することでプリンタエンジン7による印刷処理の停滞を防ぐようにしたため、ページで使用する色数に係らず全印刷処理時間の短縮を更に図ることができる。

【0035】また、上記では次ページのビットパターンに展開されてない中間コード数がページで使用する色数毎に定めた閾値より大きいかなんかを判断することで既にビットパターンに展開されたページを単独で印刷処理するかなんかを判断しているが、ビットマップ展開部4でのビットパターンの展開処理時間が各中間コードの例えば文字列からなるテキスト又は直線と曲線等からなるグラフィックスなどの情報種別、即ち、ページ上に印刷する

画像によって可変する。

【0036】そこで、テーブル8は例えば図6(c)に示すように、あらかじめ例えばLine(直線)或いはCurve(曲線)又はText(文字列など)等の中間コードの情報種別毎に設定したウエイト値T1~T3を格納する。そして、図5に示すようにホスト装置9から送られたプリントデータに従って印刷処理をする場合に中間コード変換部3は変換した中間コードをビットマップ展開部4に送出する他に、図2に示すようにページ情報31と、ビットパターンに展開されてない中間コードの情報種別を示すページ情報35を判断部6に送出する(ステップS10)。判断部6は送られたページ情報31によって次ページである例えば2ページの中間コードの変換終了を確認したときは(ステップS11)、更に送られた2ページのビットパターンに展開されてない中間コードの情報種別を示すページ情報35に従って、テーブル8に格納した該当するウエイト値T1~T3をそれぞれ選択して加算することで総ウエイト値Wを算出する。そして、算出した総ウエイト値Wがあらかじめ定めた閾値より大きいかなんかを判断する(ステップS12)。即ち、中間コードの情報種別毎に該当するウエイト値T1~T3を選択して加算することで、例えば次ページの中間コードをビットパターンに展開する処理時間である総ウエイト値Wを算出し、あらかじめ定めた閾値と比較することで次ページのビットパターンの展開処理にかかる時間が長いかなんかを判断する。

【0037】このように、次ページのビットパターンに展開されてない中間コードの情報種別に従って該当するウエイト値Tを加算することで総ウエイト値Wを算出し、算出した総ウエイト値Wがあらかじめ定めた閾値より大きいかなんかを判断し、閾値より小さいときは次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリ5に格納したページを単独で印刷することでプリンタエンジン7による印刷処理の停滞を防ぐようにしたため、ページに印刷する画像に係らず全印刷処理時間の短縮を確実に図ることができる。

【0038】

【発明の効果】この発明は以上説明したように、次ページの中間コード変換が終了しているときはビットマップメモリに次ページのビットパターンが展開されるのを待って、次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、次ページの中間コード変換が終了していないときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたから、全印刷処理時間の短縮を図ることができる。

【0039】また、次ページの中間コードの変換終了を確認した場合、更に次ページのビットパターンに展開されてない中間コード数があらかじめ定めた閾値より大き

いか否かを確認し、閾値より小さいときはビットマップメモリに次ページのビットパターンが展開されるのを待って、次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたから、全印刷処理時間の短縮を図ることができる。

【0040】また、あらかじめページの用紙サイズ毎に設定した閾値を格納し、次ページのビットパターンに展開されてない中間コード数が該当する用紙サイズの閾値より大きいかなを確認し、閾値より小さいときは次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたから、ページの用紙サイズに係らず全印刷処理時間の短縮を図ることができる。

【0041】また、あらかじめページで使用する色数毎に設定した閾値を格納し、次ページのビットパターンに展開されてない中間コード数が該当する色数の閾値より大きいかなを確認し、閾値より小さいときは次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたから、ページで使用する色数に係らず全印刷処理時間の短縮を図ることができる。

【0042】更に、次ページのビットパターンに展開されてない中間コードの情報種別に従って該当するウエイ

ト値Tを加算することで総ウエイト値Wを算出し、算出した総ウエイト値Wがあらかじめ定めた閾値より大きいかなを確認し、閾値より小さいときは次ページを含む複数ページを連続して印刷することで印刷処理の効率を上げ、また、閾値より大きいときは既にビットマップメモリに格納したページを単独で印刷することでプリンタエンジンによる印刷処理の停滞を防ぐようにしたから、ページに印刷する画像に係らず全印刷処理時間の短縮を確実に図ることができる。

【図面の簡単な説明】

【図1】この発明の一実施例の構成を示す構成図である。

【図2】ページ情報の一例を示す概要図である。

【図3】ビットマップメモリの一例を示す概要図である。

【図4】上記実施例の動作を説明するフローチャートである。

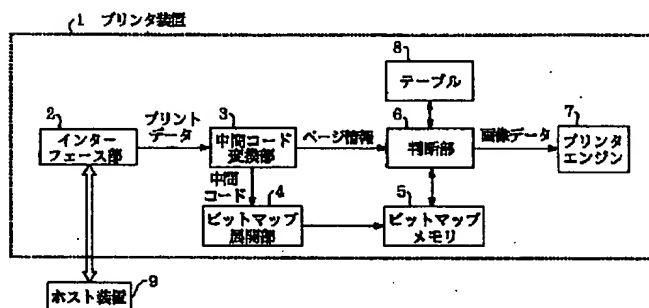
【図5】第2の実施例の動作を説明するフローチャートである。

【図6】テーブルの一例を示す概要図である。

【符号の説明】

- 1 プリンタ装置
- 2 インターフェース部
- 3 中間コード変換部
- 4 ビットマップ展開部
- 5 ビットマップメモリ
- 6 判断部
- 7 プリンタエンジン
- 8 テーブル

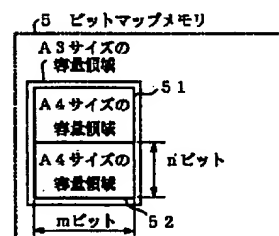
【図1】



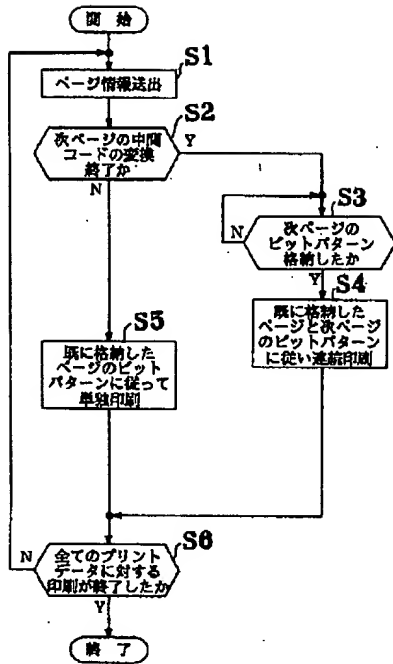
【図2】

情報	内容	
0	ページ番号P _n	
1	中間コード変換終了又は変換途中	S1
2	ビットパターンに展開されてない中間コード数	S2
3	用紙サイズ	S3
4	使用する色数	S4
5	ビットパターンに展開されてない中間コードの情報種別	S5

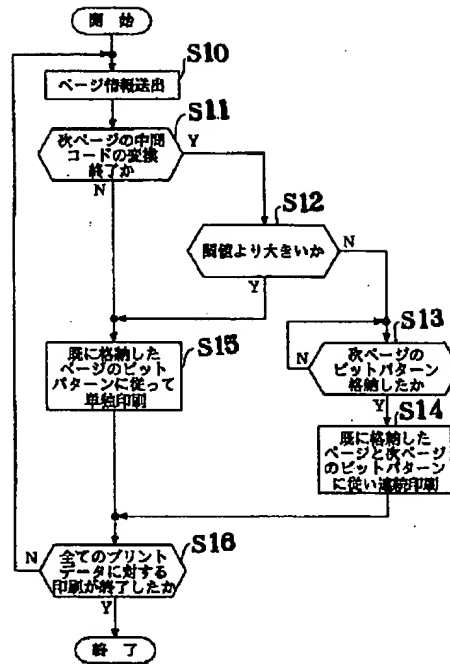
【図3】



【図4】



【図5】



【図6】

(a)

8 テーブル

用紙サイズ	
A3	閾値 81
A4	閾値 82
A4 R	閾値 83
...	...

(b)

8 テーブル

使用色数	
C	閾値 84
C+Y	閾値 85
C+M	閾値 86
...	...

(c)

8 テーブル

中間コード情報種別	
Line	ウェイト値T1
Curve	ウェイト値T2
Text	ウェイト値T3
...	...